Project information

Keywords

Calanus, gonad stages, egg production, secondary production

Project title

The new generation of Calanus finmarchicus: estimating population recruitment from egg production rates and gonad stage analysis off northern Norway (GONAD)

Year

2018

Project leader

Claudia Halsband

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

17 stations between 69°20.932N, 13°10.237E and 70°49.958N, 19°01.667E

Participants

Sünnje Basedow, UiT The Arctic University of Norway (UiT)

Emilia Trudnowska, Institute of Oceanology (IOPAN, PL)

Barbara Niehoff, Alfred Wegener Institute (AWI, DE)

Flagship

Fjord and Coast

Funding Source

Fram Centre Fjord & Coast

Summary of Results

Calanus abundances were estimated from preserved multinet samples at IOPAN. Plankton net samples containing 70-100 Calanus were taken from the deepest and surface layers and digital images were taken of each Calanus in the subsample to measure prosome length, lipid sac area and compare pigmentation. Measurements of egg production rates were performed to provide estimates of the reproductive output
for later recruitment to the population. At 17 stations, 23-26 Calanus females
were picked out from WP2 net samples collected from 40 m depth to 20 m and from 10 m to the
surface. They were individually incubated in transparent plastic cups, fitted with a false
bottom mesh of 180 µm mesh size. After 24 hours the females were removed,
photographed for subsequent size measurement and preserved in alcohol. The eggs were counted under
a stereo microscope and the number of spawning females was recorded (Fig. 1).

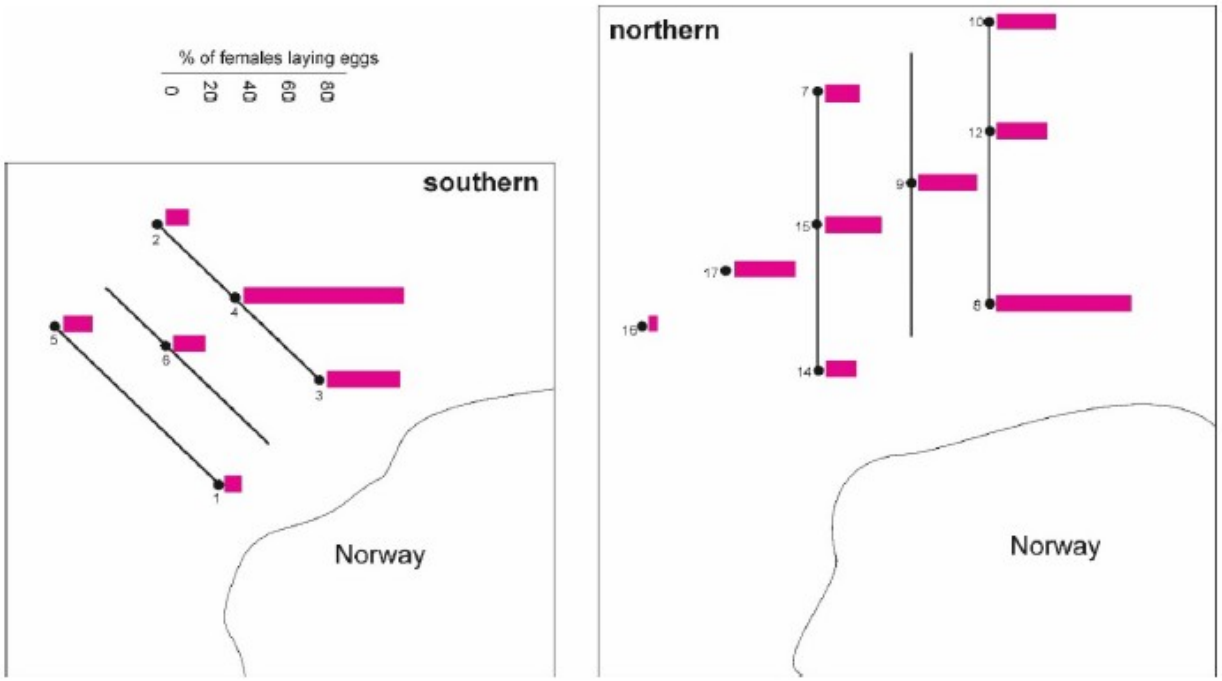

Fig. 1: Proportion of spawning females at each station

Both the proportion of spawning females and the number of eggs produced per females were highly variable, but almost all incubated females spawned eggs and were thus actively reproducing (Fig. 2). The highest clutch size was 88 eggs.

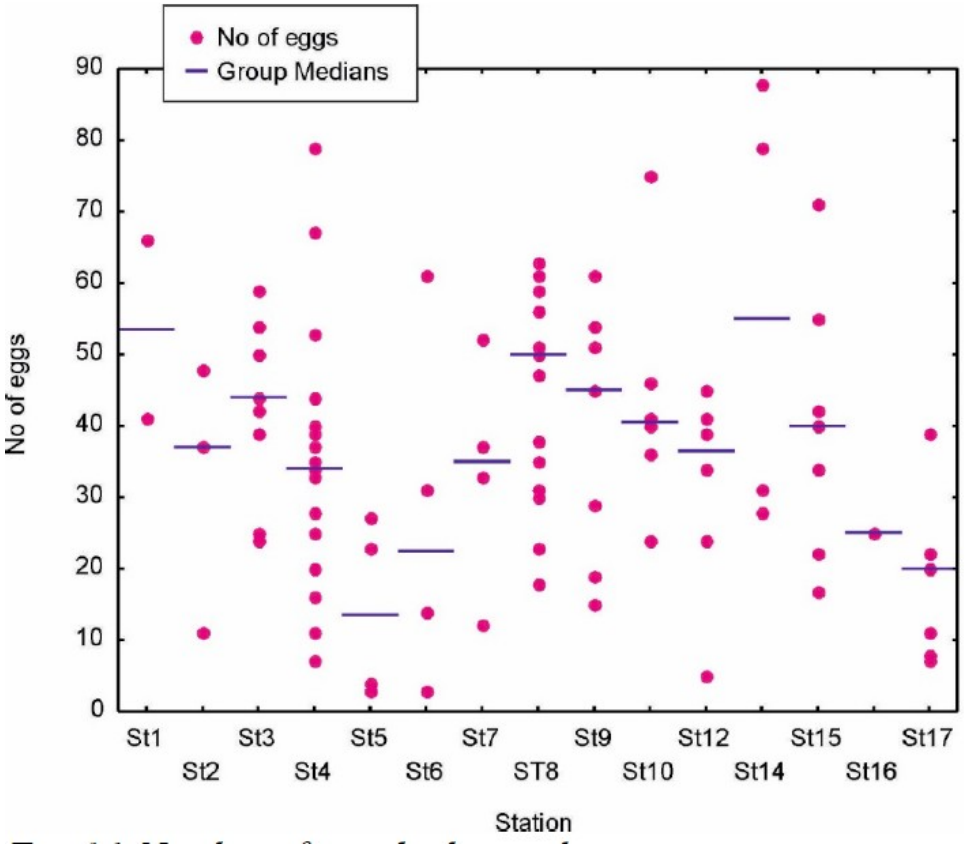

Fig. 2: Number of eggs spawned by individual females at each station and median per station.

Gonad stage analysis will be performed at AWI in December 2018 on preserved material from the cruise off Lofoten in 2017 and continued in 2019 with the sample material from 2018.

Master and PhD-students involved in the project

none

For the Management

Arctic coastal food webs support large fish populations through highly abundant zooplankton resources that serve as the primary food source for fish larvae. Zooplankton stock size is directly related to initial population size plus reproduction minus predation losses, but none of these parameters are easily obtained for advective marine populations. In GONAD, we experimentally determine egg production rates and relate those to potential clutch sizes estimated from gonad maturation stages of preserved females to quantify population reproduction along the coast of northern Norway. In combination with available population size data population growth and secondary production can be calculated. GONAD contributes new knowledge on the timing and geographical variations of reproduction and recruitment in *Calanus* off the north Norwegian coast to facilitate predictions of potential shifts in recruitment phenology and impacts on fish recruitment under climate warming.

Published Results/Planned Publications

planned for 2019/20

Communicated Results

Dialogdagen 2018, Fram Centre

Budget in accordance to results

according to plan

Could results from the project be subject for any commercial utilization

No

Conclusions

Conclusions will become available in year 3 of the project.